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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,138	10/30/2003	Jung Yun Do	51876P404	3451

8791                      7590                      08/24/2005

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EXAMINER

KUGEL, TIMOTHY J

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

<b>Application No.</b> 10/699,138	<b>Applicant(s)</b> DO ET AL.	
<b>Examiner</b> Timothy J. Kugel	<b>Art Unit</b> 1712	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1)  Responsive to communication(s) filed on 07 June 2005.
- 2a)  This action is **FINAL**.
- 2b)  This action is non-final.
- 3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4)  Claim(s) 1-6 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5)  Claim(s) \_\_\_\_\_ is/are allowed.
- 6)  Claim(s) \_\_\_\_\_ is/are rejected.
- 7)  Claim(s) 1-6 is/are objected to.
- 8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9)  The specification is objected to by the Examiner.
- 10)  The drawing(s) filed on 30 October 2003 is/are: a)  accepted or b)  objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \*    c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1)  Notice of References Cited (PTO-892)
- 2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/30/2003.
- 4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5)  Notice of Informal Patent Application (PTO-152)
- 6)  Other: \_\_\_\_\_

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**DETAILED ACTION**

1. Claims 1-6 are pending as filed on 30 October 2003.

***Election/Restrictions***

2. Applicant's election without traverse of the species of polymer of Formula 21 in claim 2 and the species of chromophore AIDC from Table 1 in claim 3 in the reply filed on 7 June 2005 is acknowledged.

***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Specification***

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.
5. A substitute specification excluding the claims is required pursuant to 37 CFR 1.125(a) because the specification is not in proper idiomatic English and in compliance with 37 CFR 1.52(a) and (b).

A substitute specification must not contain new matter. The substitute specification must be submitted with markings showing all the changes relative to the immediate prior version of the specification of record. The text of any added subject matter must be shown by underlining the added text. The text of any deleted matter must be shown by strike-through except that double brackets placed before and after

Art Unit: 1712

the deleted characters may be used to show deletion of five or fewer consecutive characters. The text of any deleted subject matter must be shown by being placed within double brackets if strike-through cannot be easily perceived. An accompanying clean version (without markings) and a statement that the substitute specification contains no new matter must also be supplied. Numbering the paragraphs of the specification of record is not considered a change that must be shown.

### ***Claim Objections***

6. Claims 1-6 are objected to because of the following informalities: In claim 1, the word 'the' should appear between the words 'coupled' and 'end'; In claim 4, the word 'part' should be 'some'. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 2 and 3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites, "...organic chromophores coupled with the ends of a polymer..." however, it is unclear in claims 2 and 3 where the coupling takes place. For the purpose of examination, claim 2 was construed to additionally recite, "...wherein the polymer couples to said chromophore at a pendant OH group forming an ester or ether linkage" and claim 3 was construed to additionally recite, "...wherein the chromophore couples to said polymer at the pendant OH group forming an ester or ether linkage."

Regarding claim 2, the improper phrasing of the Markush group renders the claim indefinite because it is unclear which members of the group are part of the claimed invention. Markush groups must be stated in the alternative, of which one acceptable form is "...selected from the group consisting of A, B and C." See MPEP § 2173.05(h). For the purpose of examination, claim 2 construed to recite, "...any one selected from the group consisting of the polymers illustrated is Formulas..."

Regarding claim 3, the inclusion of chemical structures within a table renders the claim indefinite because it is unclear whether the included structures part of the claimed invention. For the purpose of examination, claim 3 construed to recite, the chemical structures in Table 1 as members of a Markush-type group.

Further regarding claim 3, claim 3 recites the limitation "...wherein R and R' are H, Ph or..." It is unclear what the acronym Ph stands for. For the purpose of examination, claim 3 was construed to recite, "...wherein R and R' are H, a phenyl group or..."

#### ***Allowable Subject Matter***

9. Regarding claims 4-6, since no prior art was found that anticipates or renders obvious the elected species, the search of the Markush-type claim was extended resulting in prior art rejections, which follow.

#### ***Double Patenting***

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA

Art Unit: 1712

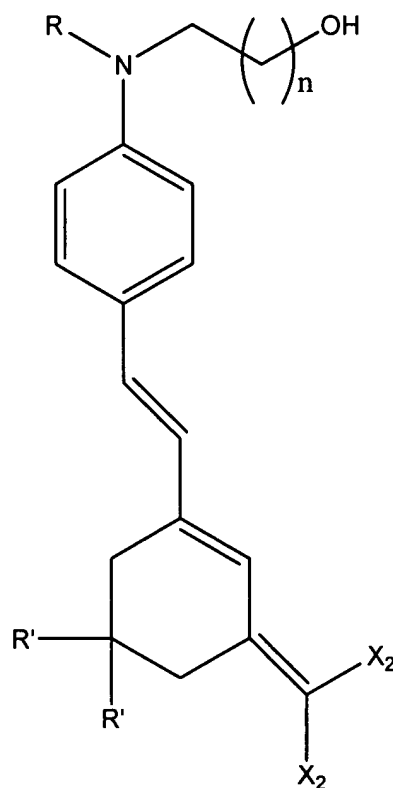
1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1-3 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of US 6,784,287 (Do '287).

Although the conflicting claims are not identical, they are not patentably distinct from each other because Do. '287 claims a nonlinear optical material comprising a



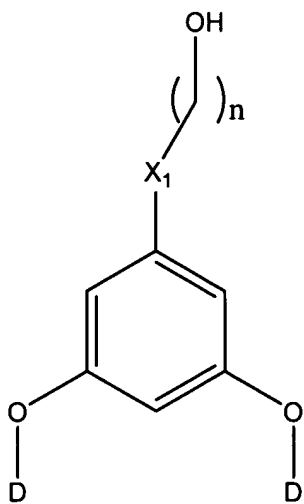
chromophore represented of the structure

which

anticipates the instantly claimed elected species of chromophore when R is an alkyl or phenyl group having 1 to 6 carbon atoms, both R' groups are methyl groups, one X<sub>2</sub> is

Art Unit: 1712

a methyl group and the other is a CN, and n is an integer from 1 to 11; coupled to a



molecule of the structure which is described in the specification as a dendrimer polymer (Column 2 Lines 12-24 See *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970)) from this structure, one of ordinary skill in the art would immediately envisage the structure of the elected species.

### ***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Do et al.,

Nonlinear optical materials containing organic chromophores of dendrimer structures:

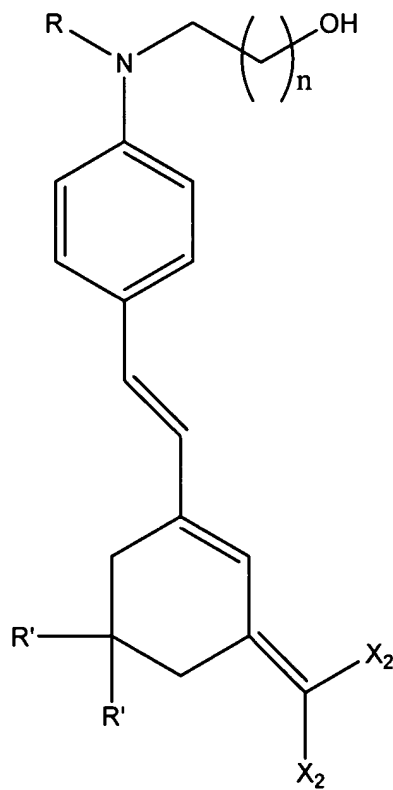
Art Unit: 1712

Synthesis and Optical properties, Photonics Conference 2002, October 30-November 1 2002, 497-498 (Do 2002).

Do 2002 teaches a non-linear optical material comprising the elected polymer having the dendrimer structure shown in Formula 21 of the instant claim 2, with the elected organic chromophore identified as AIDC in Table 1 of the instant claim 3 coupled by ether linkage at the site of the terminal hydroxy groups of said polymer (Formula TDAIDC101 Page 498).

14. Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,784,287 (Do '287).

Do. '287 teaches a nonlinear optical material comprising a chromophore



represented of the structure

(Formula (3) A-2 Column 3

Line 60 – Column 5 Line 2 and Claim 1 Formula (3) A-2 Column 15 Line 43 – Column



Art Unit: 1712

16 Line 46) which anticipates the instantly claimed elected species of chromophore when R is an alkyl or phenyl group having 1 to 6 carbon atoms, both R' groups are methyl groups, one X2 is a methyl group and the other is a CN, and n is an integer from 1 to 11; coupled to a dendrimer polymer (Column 2 Lines 12-24, Formula (1) Column 3 Lines 10-34 and Claim 1 Column 15 Lines 25-43).

The applied reference has a common assignee and at least one common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

15. Claims 1 and 3-5 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,252,025 (Wang '025).

Wang '025 teaches a nonlinear optical material comprising a dendritic polymer with multiple active end groups (Column 3 Lines 48-62) including chromophores (Column 1 Lines 26-55) and non-chromophores including phenyl and alkyl groups (Column 6 Lines 9-33).

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) a patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claim 6 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Wang '025.

Wang teaches a nonlinear optical material comprising a dendritic polymer with multiple active end groups including chromophores and non-chromophores including phenyl and alkyl groups as detailed above.

Since Wang '205 teaches the same composition as claimed, one of ordinary skill in the art at the time the invention was made would have expected that the ability of the active end groups to induce thermal and optical chemical reactions of the Wang '025 composition would inherently be the same as claimed.

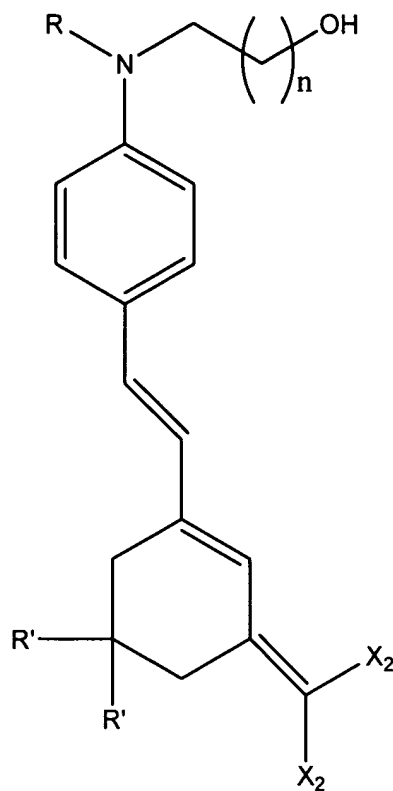
Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." *In re Best*, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977).

***Claim Rejections - 35 USC § 103***

18. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being obvious over Do '287.

Art Unit: 1712

Do. '287 teaches a nonlinear optical material comprising a chromophore



represented of the structure

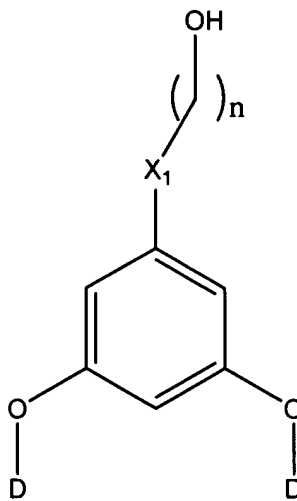
(Formula (3) A-2 Column 3

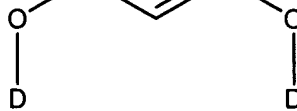
Line 60 – Column 5 Line 2 and Claim 1 Formula (3) A-2 Column 15 Line 43 – Column

16 Line 46) which anticipates the instantly claimed elected species of chromophore

when R is an alkyl or phenyl group having 1 to 6 carbon atoms, both R' groups are

methyl groups, one X<sub>2</sub> is a methyl group and the other is a CN, and n is an integer from



1 to 11; coupled to a molecule of the structure  which is described in the specification as a dendrimer polymer (Column 2 Lines 12-24, Formula (1) Column 3 Lines 10-34 and Claim 1 Column 15 Lines 25-43) from this structure, one of ordinary skill in the art would immediately envisage the structure of the elected species.

The applied reference has a common assignee and at least one common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection

Art Unit: 1712

might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

### ***Conclusion***

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 5,723,511	03-1998	Kazmaier et al.
US 2002/0155523	10-2002	Sparks

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Kugel whose telephone number is (571) 272-1460. The examiner can normally be reached Monday-Thursday.

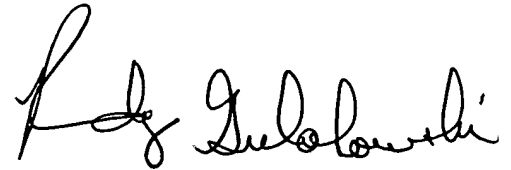
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

21. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/699,138  
Art Unit: 1712

Page 13

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Art Unit 1712

A handwritten signature in black ink, appearing to read "Randy Gulakowski". The signature is fluid and cursive, with the first name "Randy" written in a larger, more prominent script than the last name "Gulakowski".

**RANDY GULAKOWSKI**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 1700**